

THE THREE S'S

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The Detroit Committee For Seven Eastern Women's Colleges

Madame Chairman, Mr. Morrow, Ladies and Gentlemen:

I don't suppose that you who were born to freedom can fully appreciate what the sight of this great audience means to one who is American by choice, and who knows from personal experience what it is like to live under a regime which denied the existence of freedom.

Occasions such as this make me feel humble. They are the essence of the greatness of this country. I can only hope that what I have to offer tonight, by way of a discussion of our educational system, will contribute even a little toward the solution of the problem posed to me.

It is not at all surprising that I should be asked to discuss the relation of education, in the broadest sense, to the advent of the Space Age. While I know little about education professionally, as an employer I must of necessity observe the product of our educational system. So I start with a certain feeling of confidence because space is so big that no one knows too much about it and knowing even a little about half of my topic entitles me to extrapolate about the remainder.

So many experts on space have turned up lately that I am not as certain today about what I know as six months ago. When every daily newspaper carries learned discussions about missiles, satellites, and Moon ships it becomes a little difficult for a toiler in the vineyard to keep up with the latest thinking. Those of us involved in this engrossing business spend so much time building and launching rockets that we are in danger of losing contact with more advanced commentators who do not wrestle with balky hardware and can allow their imaginations to roam at will. Perhaps a school teacher shares kindred emotions when she reads the criticism recently directed towards our schools.

Yet we do have a problem. It is obvious that space has captured public imagination. I am told that one of the major concerns in school these days is to keep young rocket enthusiasts from blowing themselves, their classmates and the school into smithereens. Recent issues of the national Boy Scout magazine, to cite an example, carried articles on advanced rocketry, a discussion of space travel by a 15-year-old contributor, and a report from an 18-year-old Scout on how to build a million electron volt cyclotron. My personal mail contains hundreds of letters from boys and girls all over America seeking advice on rocket fuels, guidance systems, and related subjects.

It seems to be axiomatic that the more wisdom one acquires the less one is tempted to gamble. I can recall putting a gasoline torch to an experimental rocket at the age of 18, so intent upon the outcome of the test that I was altogether oblivious to the hazard. But having witnessed accidents which maimed or killed others close to me, and having acquired some understanding of the forces involved, I am strongly inclined to discourage teen-agers from risking their necks as I once did. Perhaps that makes me a reactionary and perhaps my opposition to uncontrolled rocket experiments dates me as no other single incident could.

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The manifestation of such overwhelming desire for information on the part of thousands upon thousands of young people is disturbing. Hunger after knowledge should inspire those who can satisfy it and challenge those who must provide the means by which the nourishment of education can be supplied. When a child seeks truth he must be helped to find it.

It should be understood that the fascination of the rocket was not the aftermath of Sputnik nor the Explorers. It is my conviction that youth the world over had embraced the concept of rocket-powered space travel long before the first earth satellite appeared. The stunning realization that the Space Age had indeed arrived caught our adult population unawares. As usual, the elder was several years behind the child in accepting as fact things which had not yet been physically demonstrated.

It should also be understood that the torrent of criticism mounted against our educational system, which blew up into a tidal wave when Soviet and American technologies were compared, did not originate with Sputnik. For some time conscientious parents had voiced doubt as to the product of the "progressive" influence in public schools which seems to be more concerned with communal living than with basic learning. A critic of educational methods soon learns that a pedagogue is the most sensitive and vocal of creatures. All too often he belongs to an articulate, well-organized protective society whose function it is to discourage those outside the pale from peering within.

Recently the "Made in America" cry has been raised in defense of those educational policies under sharpest attack. The defense argues that nothing good can be found in schools anywhere else, least of all in those European nations where

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quality is the objective of the teaching profession. It seems to me that if educational criteria must be exclusively home-style, we must begin our study of history with the American Revolution, if not with John Dewey; writing with Mr. Gregg, reading with Mr. Guffey, and medicine with the Smith Brothers.

Let's be rational about this. The provision of adequate education must concern every parent whether his name is O'Brien, Wisniewski, von Braun or Jones. We who believe that democracy offers the best system under which men can live and progress must also realize that the advancement of a democratic society requires a literate electorate. Education's task is to prepare the citizen of tomorrow for the kind of society in which he will live and work 5, 10, 15 years hence. It follows that education must be concerned with the future. What then will be the future in which the youth of today will live; and what are the schools doing to prepare him for it?

It is this question which every citizen has a right to ask and to which he expects a prompt and full answer. The recent demonstrations of technology in the air, in space, or under the ocean are but the more spectacular of many allied advances in science and engineering, all of which underline the essentials. The informed citizen in the Space Age must, as an irreducible minimum, comprehend the fundamental laws which govern his universe. He must understand mathematics; he must have a foundation in the physical sciences. Lacking these he cannot have the capability to evaluate novel events unprecedented in human experience, nor to interpret their influence upon affairs of this planet and upon other worlds towards which our first steps have been taken.

Many cities, some States and the Federal Government have undertaken to promote education in scientific fields. This has meant provision of additional facilities

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such as laboratories, the construction of new schools, increased teachers' salaries, and offering graduate study opportunities to improve teaching performance. All of these will help, to be sure but we cannot afford to be parochial and we cannot regard this as a matter of temporary concern.

Faced with aggressive competition abroad, we dare not assume that all will go well once the tax budget has been approved or the new school bond issue floated. To provide a well-rounded curriculum in major centers of population and do little to improve the quality of education elsewhere is tantamount to condemning countless numbers of children to half loaves at best. One might as well expect Hal Newhouser to pitch the Tigers to a pennant with a third rate team behind him.

I have no doubt that Detroit schools will stand comparison--but is the citizen of Detroit also concerned about the school-age child in Ishpeming or Rudyard? Does that child have available to him equal quality in teaching, duplicate facilities in laboratories and libraries--equal opportunity to develop his talent?

This is not to say that every child must become a scientist. Heaven forbid! I do not think any of us would be happy in such an environment if indeed we managed to survive. What I do say is that this problem is a national one and that it will not be fully resolved until it is attacked on that scope.

It is high time, in my opinion, to talk about The Three S's as we once talked about The Three R's. We must put the proper emphasis upon science as a basic educational requirement, upon selection in the choice of career preparation, and upon study in the acquisition of knowledge.

When we mention selectivity in the context of free public education the fear arises in some quarters that one student might receive preferential treatment and that this cannot be tolerated in a democratically constituted and publicly supported system. Such arguments deny the realities of life. Selection is as much a part of

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Nature as the sun, water and air. It is actually practiced in many schools today, but to avoid possible criticism the practitioners call it "guidance." By various tests, a directed effort is made to determine the child's capabilities, to ferret out hidden talent, and to guide his selection of courses of study in preparation for his career.

I think this testing process merits careful investigation for it behooves us to be as certain as is humanly possible in a program whose effects can have grave consequences. Carrying this approach to a logical conclusion, we should be able to discover at the earliest practicable age which child can profit most or contribute most in scientific, mathematical or engineering disciplines, the manual trades, the arts or other professions. Let no one assume for a moment that the swift advance of technology eliminates the need for craftsmanship; it takes expert plumbers, machinists, welders--in fact, hundreds of special skills, to fabricate and assemble giant rockets as well as nuclear reactors or other 20th Century devices.

My education was obtained in European schools where absolute knowledge of a subject, plus the ability to employ it properly, became the sole measure of progress. That may be old-fashioned but I still believe it represents the sine qua non of the Space Age just as it did in the Age of Sail or the Age of Steam.

As a parent myself, I am not persuaded that a periodic report from school advising that Johnny's attitude is good, not so good or terrible is any real substitute for a report which tells father that Johnny missed certain questions on a mathematics test, or that he misspells 25 percent of the words he writes, or that he can't read intelligently, or that the teacher can't read his script.

The overriding concern in so many schools with personal attitudes, social adjustment, and neighborly relations seems hopelessly out of tune with an era in

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which manmade stars are launched into the Heavens and in which we can schedule human explorations of the nearer reaches of the Universe. Perhaps it is another sign of my innate conservatism, but I believe that teaching Mary how to get along with others is the responsibility of her parents--not that of a teacher whose primary purpose in life is to impart knowledge to 25 eager young brains in the course of 152 school days per year.

What kind of challenge do we offer an inquiring mind when we spend so much time discussing the importance of getting along with the group? Maybe the student would much rather dissect a frog, or write an essay about Francis Bacon, or find out why a gyroscope helps to steer a rocket. Let's not forget that the single-minded individual, the fellow who pays little or no attention to society, is usually the character who comes up with the great discoveries upon which depends much/<sup>of</sup> mankind's progress.

Do we encourage study? Do we provide an environment conducive to learning by sheer effort and concentration? On the contrary, we dangle so many enticements in the form of extracurricular activities before the student that he is seduced away from the book. In fact, he risks the tag of social outcast unless he does exactly what the group chooses to do. Is it easier to raise money for laboratories than football stadiums? I cannot help wondering what might come out of our schools if we spent equal energy and money in the development of students which we expend on the development of athletes. In short, where are we placing the emphasis? I think a good case can be made out to support the contention that we shape our educational programs too much in terms of mass and not enough in terms of the needs of the individual. Perhaps we have tried to transplant the Detroit assembly line technique into a situation which, because it deals wholly with the human equation, does not lend itself to engineered production.

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There is a financial aspect to this problem, as there is to most problems when they are of major stature. I have little sympathy with those who raise anguished cries at the fear of Federal interference in a school system which traditionally is a community responsibility. If we can spend billions to build new highways, and more billions to help agriculture, I think we can afford to do something for the most important crop of all--the minds of young America.

The greatest adventure of all history awaits this and subsequent generations--the exploration of outer space. Confronted by such a prospect, it is little wonder that impatient youth wants to leapfrog the hard work of mastering physics, chemistry, algebra or calculus and take off for the Moon instantly. Young minds can understand the real significance of the big missiles we are developing. These are transportation systems, not simply a means of destruction, which can transport passengers or cargo equally as well as thermonuclear warheads between points on earth or between earth and points in space. Just as the sailing vessel provided the means for Marco Polo or Columbus, so too the rocket can become the vehicle of exploration.

It is because of the arduous labors of many scientists over many ages that we are much better prepared to set out upon this magnificent quest than were the explorers of old. We already know the requirements in terms of propulsive power and guidance; indeed, we have engineered the necessary hardware, at least for the initial stages of space flight. But we lack a good deal of information about the spatial environment. Thanks to the success of our Explorers, we are acquiring invaluable data in such volume that it will take more time to reduce and interpret it. The space man, when he ventures out from a base on earth, will be the best prepared explorer ever dispatched.

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The sense of urgency which accompanies all our direct and indirect actions in these monumental undertakings has not been lost upon youth. They appreciate the need for bold, dynamic, imaginative and creative effort in all the fields of physical science and technology. If they lack anything in this respect it is the kind of appreciation which normally comes with maturity for the broad preparation necessary to participate actively and fruitfully in the great events which lie in store. My appraisal of the younger graduates of our universities is that they are well prepared indeed in their field of specialization but they do not have the breadth of knowledge in related fields which they must have to grapple with problems hitherto unknown to or unsolved by science and engineering.

In summary, I would like to leave these thoughts with you:

First, we must reshape our educational offerings to meet tomorrow's requirements.

Second, we must single out at the earliest possible age the scientists, mathematicians and engineers whose contributions will make possible our further advances in the Space Age.

Third, we must provide the necessary facilities and the most helpful instruction possible in our public schools.

Fourth, we must reexamine the areas of emphasis in our educational system and concentrate upon those of lasting importance.

Fifth, as parents we must accept our just responsibilities and relieve our school teachers of concerns which are rightfully ours.

Finally, we must satisfy the earnest quest of the young for knowledge of the unknowns which will influence their future lives.

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